

Appl. No. : 09/650,122
Filed : August 29, 2000

REMARKS

Claim 1 has been amended to delete an unnecessary limitation which was previously inserted. This amendment raises neither the issue of new issues nor the issue of new matter. Applicants respectfully request entry of the amendments and reconsideration of the application in view of the amendments and the following remarks.

Rejections Under 35 U.S.C. § 103

Claims 1 and 7 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Adams in view of Predhome Jr.

Claim 4 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Adams in view of Predhome Jr and further in view of Hautau.

Claim 5 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Adams in view of Predhome Jr and further in view of Phillips.

The Examiner asserts "the exact angles and distances of the groove and follower depend upon load, velocity, acceleration and deceleration and are normal adjustments needed to make the cam mechanism work. Adjustments of this type have been held obvious." Applicant respectfully traverses these rejections.

M.P.E.P. 2141.01(a) states:

ANALOGY IN THE MECHANICAL ARTS

See, for example, *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992) (Applicant claimed an improvement in a hose clamp which differed from the prior art in the presence of a preassembly "hook" which maintained the preassembly condition of the clamp and disengaged automatically when the clamp was tightened. The Board relied upon a reference which disclosed a hook and eye fastener for use in garments, reasoning that all hooking problems are analogous. The court held the reference was not within the field of applicant's endeavor, and was not reasonably pertinent to the particular problem with which the inventor was concerned because it had not been shown that a person of ordinary skill, seeking to solve a problem of fastening a hose clamp, would reasonably be expected or motivated to look to fasteners for garments. The Commissioner further argued in the brief on appeal that a disengageable catch is a common everyday mechanical concept, however the court held that the Commissioner did not explain why a "catch" of unstated structure is such a concept, and why it would have made the claimed invention obvious.).

In the present invention, the following problems in a load-lock chamber are solved:

(1) Great suction force (e.g., 700 kgf or 1,300 kgf) due to the pressure difference (e.g., the difference between a vacuum and atmospheric pressure) is exerted on a plate toward a transfer

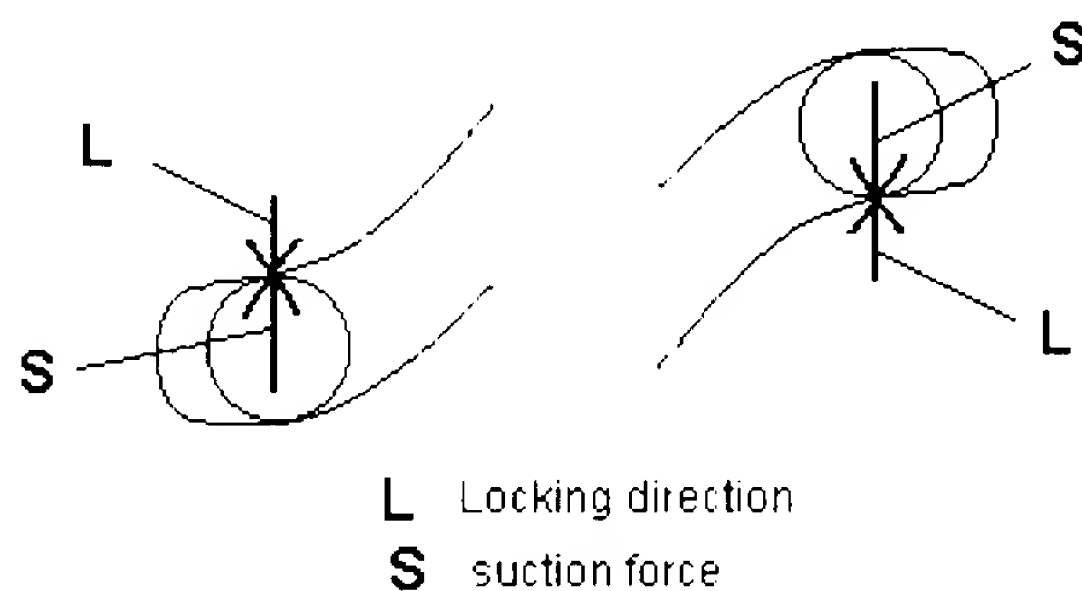
chamber, and in order to cope with the force, a conventionally used electromagnetic brake requires periodic maintenance (page 1, lines 16-24).

(2) The great suction force changes when manufacturing wafers with different diameters, and in order to accommodate the changes, a conventionally used electromagnetic brake requires increased frequency of maintenance work (page 1, lines 25-28).

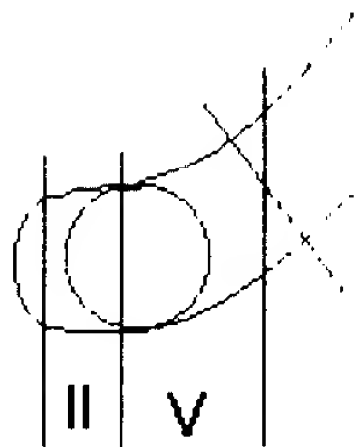
(3) The plate receives great suction force in the opposite directions at upper and lower sealing positions, and in order to cope with the suction force in the reversed direction, the frequency of maintenance work (brake adjustment) of the brake increases (page 1, line 29 to page 2, line 2).

(4) In order to prevent particle contamination from an O-ring seal if used, the plate is required to slow down immediately before and after a sealing position (page 2, lines 3-7).

In the present invention, by using the specific cam structures, the above problems are effectively solved. For example, when the cam follower is both in the upper and lower self-locking positions of the groove, the locking direction is opposite to a direction of resisting against the suction force, so as to securely and effectively seal the chamber with the plate even though the suction force is beyond 1,000 kgf.



Further, for example, in order to eliminate a risk of particle contamination, the transition sections of the groove are made longer than the locking sections so that the moving rate of the plate near the seal can effectively be reduced.



In contrast, Predhome Jr.'s cam is used in valves provided in a combustion engine. The valve lift mechanism for a combustion engine is completely irrelevant to any of the above problems, and further, Predhome Jr. does not teach or even suggest the above cam structures of the present invention. Lifting a valve of an engine is entirely different from lifting a plate of a load-lock chamber. Furthermore, Predhome Jr.'s cam is simply used for opening and closing the valve at a single position, not for air-tightly sealing at upper and lower positions. Cam mechanisms have never been used for this type of apparatus, especially for a load-lock chamber. Thus, it cannot be reasonable to conclude obviousness of the present invention based on Predhome Jr.

M.P.E.P. 2141.01(a) also states:

In re Clay, 966 F.2d 656, 23 USPQ2d 1058 (Fed. Cir. 1992) The court disagreed with the PTO's argument that the reference and claimed inventions were part of the same endeavor, "maximizing withdrawal of petroleum stored in petroleum reserves," and found that the inventions involved different fields of endeavor since the reference taught the use of the gel in a different structure for a different purpose under different temperature and pressure conditions, and since the application related to storage of liquid hydrocarbons rather than extraction of crude petroleum. The court also found the reference was not reasonably pertinent to the problem with which the inventor was concerned because a person having ordinary skill in the art would not reasonably have expected to solve the problem of dead volume in tanks for refined petroleum by considering a reference dealing with plugging underground formation anomalies.

Thus, a combination of Predhome Jr. (valves of an engine) and Adams (a load-lock chamber) cannot reasonably be accomplished to render the present invention obvious.

Next, Applicant respectfully traverses the Examiner's assertion "it would have been obvious to eliminate the two redundant plates in Adams to reduce cost."

M.P.E.P. 2144.04 states:

Omission of an Element with Retention of the Element's Function Is an Indicia of Unobviousness

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Note that the omission of an element and retention of its function is an indicia of unobviousness. In re Edge, 359 F.2d 896, 149 USPQ 556 (CCPA 1966) (Claims at issue were directed to a printed sheet having a thin layer of erasable metal bonded directly to the sheet wherein said thin layer obscured the original print until removal by erasure. The prior art disclosed a similar printed sheet which further comprised an intermediate transparent and erasure-proof protecting layer which prevented erasure of the printing when the top layer was erased. The claims were found unobvious over the prior art because the although the transparent layer of the prior art was eliminated, the function of the transparent layer was retained since appellant's metal layer could be erased without erasing the printed indicia.).

In the present invention, a single divider plate is used, whereas Adams uses three divider plates. Adams uses three divider plates in order to avoid intensive suction force which is exerted on the shaft (64) (and also to minimize the space to be evacuated). When using three divider plates, there is no suction force exerted on the shaft because only the middle section is evacuated. When eliminating two divider plates, the suction force is exerted directly on the shaft because the evacuated section is not in the middle, and the suction force significantly increases because the evacuated space is approximately doubled. Thus, the problems mentioned above occur. In the present invention, even though only one divider plate is used, the load lock chamber's function can effectively remain by using the specific cam structures. The Examiner asserts that the other two plates are redundant. However, the use of a single plate creates unique problems which never occur in the use of three plates, and thus the two other plates are not simply redundant. In the present invention, even without the other two, the load-lock chamber functions effectively. Thus, the present invention could not be obvious over Adams in view of Predhome Jr.

Hautau and Philllips are irrelevant to the above aspects of the invention.

The remaining claims are dependent on Claim 1, and at least for this reason, the remaining claims also could not be obvious over the prior art.

Applicant respectfully requests withdrawal of the rejections.

CONCLUSION

In light of the Applicants' foregoing Remarks, it is respectfully submitted that the present application is in condition for allowance. Should the Examiner have any remaining concerns which might prevent the prompt allowance of the application, the Examiner is respectfully invited to contact the undersigned at the telephone number appearing below.

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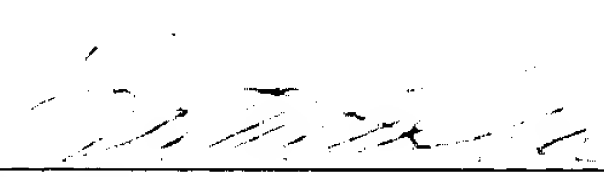
Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: May 19, 2003

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